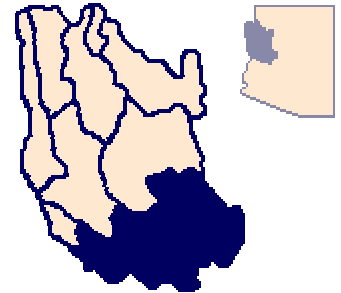


BILL WILLIAMS BASIN

The Bill Williams basin consists of approximately 3,200 square miles (Figure 13). The west portion of the basin is in the Basin and Range province and the east portion is in the Central Highlands province. The basin is bounded by the Hualapai Mountains on the north, the Mohave Mountains on the east, and the Harcuvar and Buckskin Mountains to the south. Land surface elevations in this area range from approximately 6,000 feet above mean sea level in the north near Bear Mountain to less than 1,000 feet above mean sea level in Mohave Wash to the east.



Groundwater in the Bill Williams basin occurs in younger alluvial deposits, in basin-fill, and in fractured and porous volcanic rocks. The water-bearing ability of these units vary within the basin.

The younger alluvium consists of gravel, sand, and silt and is present in places along the Bill Williams River and its major tributaries. These deposits are also the main water-bearing unit in Peeples Valley, which is located in the southwest corner of the Bill Williams basin. Except for the Peeples Valley area, these deposits are of small areal extent. However, where present, the alluvial deposits have high water-yielding potential. Wells tapping this unit along the Bill Williams River and its major tributaries, are used primarily for irrigation and domestic supplies. Yields from large-capacity irrigation wells are reported at 100 to 4,000 gallons per minute. Wells in the Peeples Valley are used mainly for domestic and livestock supplies and just a few wells are used for irrigation. Well yields in the Peeples Valley area range from 20 to 2,000 gallons per minute and water levels have fluctuated in the past 33 years (Sanger and Littin, 1981).

The main water-bearing unit is the basin-fill. These deposits are recharged from streamflow infiltration and precipitation along the mountain fronts. Groundwater movement in this area generally is in the same direction as streamflow. Thickness of basin-fill deposits, which has been estimated from test-hole data, range from 200 feet to more than 1,000 feet in Copper Basin in the Central Highlands province and may be more than 5,000 feet in the Bullard Wash - Date Creek area in the Basin and Range province. Large-capacity wells which tap the basin-fill are reported to yield 50 to 1,200 gallons per minute.

An important water-bearing unit in the Copper Basin area is a 1,000-foot thick sequence of volcanic rocks. The volcanic sequence is separated from the overlying basin-fill deposits by a 35-foot thick confining bed of well-cemented sand and clay. The upper 350 to 400 feet of these volcanics may produce more than 2,000 gallons per minute (Sanger and Littin, 1981).

In addition to the water-bearing formations discussed above, schist, gneiss, and granite, where sufficiently fractured or decomposed, may contain enough water for domestic and livestock supplies. In the Bagdad area, there are zones in the granite that have been crushed by faults. Wells that tap these areas yield more than 100 gallons per minute. Groundwater in faults and fractures is sensitive to recharge and may not constitute a dependable supply.

Ephemeral and perennial springs issue primarily from the volcanic and crystalline rocks, respectively, and are subject to seasonal variations in precipitation. Some of these springs were measured by the U.S. Geological Survey in 1979. The discharges of the ephemeral springs ranged from less than 1 to 27 gallons per minute and most of the perennial springs ranged from 1 to 36 gallons per minute (Sanger and Littin, 1981). Perennial springs can be found in several places along the Santa Maria River and Burro Creek. These perennial stretches are sustained by groundwater discharge (Brown and others, 1978).

Water quality generally is good within the basin-fill. Most of the groundwater sampled in the area is suitable for human consumption without treatment. Groundwater sampled outside the alluvial basin was typically higher in total dissolved solids and fluoride concentrations but was not considered to be part of the major water-bearing unit (basin-fill).

Most of the water used in the Bill Williams area is groundwater, although a small amount of surface water also may be diverted. About 18,000 acre-feet of groundwater were withdrawn in 1979 (U.S. Geological Survey, 1981). Approximately 17,000 acre-feet were used for the irrigation of 5,200 acres. Most of the irrigated land is in Skull Valley and along lower reaches of Kirkland Creek. Although no current data are available for this area, it is reasonable to assume that these numbers are still valid.